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| STEUBING AND MCGUINESS & MANARAS LLP | | | CURS, NATHAN M | |
| 125 NAGOG PARK | | | ART UNIT | PAPER NUMBER |
| ACTON, MA 01720 | | | 2633 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 09/783,002 | Applicant(s) GRAVES ET AL. | |
| | Examiner Nathan Curs | Art Unit 2633 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 10-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 10-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 11, 12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tshushima et al. (US Patent No. 6424445) in view of Eggleton et al. (US Patent No. 6370300), and further in view of Fukashiro et al. (US Patent No. 6362905).

Regarding claims 1 and 20, Tsushima et al. disclose a photonic network node comprising: means for demultiplexing an optical signal into channels (fig. 16, elements 201); photonic switch fabric (fig. 16, element 123); and means for multiplexing a plurality of channels into an optical signal (fig. 16, elements 202). Tsushima et al. do not disclose means for reducing a variance between inputs to the photonic network node by applying dynamically adjusted bulk compensation to all channels of the optical signal. Eggleton et al. disclose a photonic network node comprising: means for reducing a variance between inputs of an optical signal received at a photonic node by applying dynamically adjustable bulk compensation to all channels of the multiplexed signal (fig. 2 and col. 4, lines 14-43 and col. 4, line 65 to col. 5, line 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to use adjustable bulk compensation at the multiplexed input signal entering the node of Tsushima et al, in order to variably compensate for wavelength dispersion accumulated in the network due to non-linear effects and environmental changes in the network, as taught by Eggleton et al.

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(col. 2, lines 41-54). The combination of Tsushima et al. and Eggleton et al. do not disclose means for monitoring before and after the photonic switch fabric. Fukushima et al. disclose a photonic node comprising means for performance monitoring on each one of a plurality of channels of the optical signal before and after a cross-connect (fig. 11, elements 24 and col. 13, lines 36-50). It would have been obvious to one skilled in the art at the time of the invention to use the optical cross-connect disclosed by Fukushima et al., as the optical crossconnect of the optical node of Tsushima et al., to provide the benefits of individual signal performance monitoring for the individual signal channels, as taught by Fukushima et al. Also, the combination of Tsushima et al., Eggleton et al. and Fukushima et al. does not disclose means for performing dynamically adjustable amplitude impairment compensation on each one of the plurality of channels of the optical signal, responsive to monitoring of each channel and based at least in part on output carrier power. However, in another embodiment, Fukushima et al. disclose an optical switch fabric where amplifiers are provided between some of the outputs and inputs of the switch input and output modules, to provide the option of monitoring-based amplifying of a switched signal(s) before outputting the switched signal(s) from the optical switch (fig. 1 and col. 5, lines 25-50). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the monitoring-controlled amplifiers taught by Fukushima et al. with the optical switch of the combination of Tsushima et al., Eggleton et al. and Fukushima et al., in order to provide the benefit of amplifying some switched signals before they are output from the optical switch in response to monitoring information for the signals, as taught by Fukushima et al.

Regarding claim 2, the combination of Tsushima et al., Eggleton et al. and Fukushima et al. disclose that the photonic switch fabric includes a plurality of optical switch planes, including switching groups of wavelengths (Tsushima et al.: fig. 14 and 15 and col. 13, line 36 to col. 14,

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line 11) as well as individual demultiplexed wavelengths (Tsushima et al.: fig. 16 and col. 14, lines 12-34).

Regarding claim 11, the combination of Tsushima et al., Eggleton et al. and Fukushima et al. disclose means for monitoring including channel performance monitors (Fukushima et al.: fig. 11, elements 24 and col. 13, lines 36-50).

Regarding claim 12, the combination of Tsushima et al., Eggleton et al. and Fukushima et al. disclose mean for protecting channels of the optical signal responsive to the monitoring means (Tsushima et al.: fig. 16 and col. 13, lines 36-50).

3. Claims 3 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsushima et al. (US Patent No. 6424445) in view of Eggleton et al. (US Patent No. 6370300), and further in view of Fukushima et al. (US Patent No. 6362905), as applied to claims 1, 2, 11, 12 and 20 above, and further in view of Patterson et al. (US Patent No. 6356684).

Regarding claims 3 and 21, the combination of Tsushima et al., Eggleton et al. and Fukushima et al. disclose the node as claimed in claims 1 and 20, respectively, but do not disclose additional means for dynamically adjustably compensating for individual channel chromatic dispersion impairment. Patterson et al. disclose individual channel, dynamically adjustable, dispersion compensators in a WDM node that are controlled based on a tapped channel power feedback signal (figs. 13 and 16 and col. 9, lines 48-65, col. 10, lines 5-21 and col. 11, lines 14-23). It would have been obvious to one of ordinary skill in the art at the time of the invention to add individual channel variable compensators to each demultiplexed channel of Tsushima et al., in order to provide the benefit of compensating for any individual wavelength dispersion that may need compensation based on performance monitoring information for the individual wavelength.

4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsushima et al. (US Patent No. 6424445) in view of Eggleton et al. (US Patent No. 6370300), and further in view of Fukushima et al. (US Patent No. 6362905), as applied to claims 1, 2, 11, 12 and 20 above, and further in view of Harley et al. (US Patent No. 6323978).

Regarding claim 10, the combination of Tsushima et al., Eggleton et al., and Fukushima et al. does not disclose that the means for monitoring includes wrapper readers. Harley et al. disclose an optical channel overhead, used as a communication channel for remote monitoring between transmitters and receivers (col. 1, lines 12-42), and an optoelectronic converter for detecting an optical signal having an embedded control signal and demodulating the control signal to produce control information (col. 3, lines 26-39). It would have been obvious to one skilled in the art at the time of the invention to use optical channel overheads as disclosed by Harley et al., in the system of the combination of Tsushima et al., Eggleton et al., and Fukushima et al., for end-to-end channel monitoring and controlling channel routing.

5. Claims 13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima et al. (US Patent No. 6362905) in view of Eggleton et al. (US Patent No. 6370300).

Regarding claim 13, Fukushima et al. disclose a multi-channel photonic node comprising means for performance monitoring on each one of a plurality of channels of the optical signal (fig. 11 and col. 13, lines 36-50) and means for protecting channels responsive to the monitoring means (fig. 4 and col. 7, lines 4-41; and fig. 11 and col. 13, line 51 to col. 14, line 10) and WDM compatibility (col. 8, lines 46-52), but do not disclose means for reducing a variance between inputs to the photonic network node by applying dynamically adjusted bulk compensation to all channels of the optical signal. Eggleton et al. disclose a multi-channel photonic network node

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comprising: means for reducing a variance between inputs of an optical signal received at a photonic node by applying bulk compensation to all channels of the optical signal before demultiplexing an optical signal into a plurality of channels (fig. 2 and col. 4, lines 14-43 and col. 4, line 65 to col. 5, line 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to use adjustable bulk compensation at the multiplexed input signal entering the node of Fukushima et al., in order to variably compensate for wavelength dispersion accumulated in the network due to non-linear effects and environmental changes in the network, as taught by Eggleton et al. (col. 2, lines 41-54). The combination of Fukushima et al. and Eggleton et al. do not disclose means for performing dynamically adjustable amplitude impairment compensation on each one of the plurality of channels of the optical signal, responsive to monitoring of each channel and based at least in part on output carrier power. However, in another embodiment, Fukushima et al. disclose an optical switch fabric where amplifiers are provided between some of the outputs and inputs of the switch input and output modules, to provide the option of monitoring-based amplifying of a switched signal(s) before outputting the switched signal(s) from the optical switch (fig. 1 and col. 5, lines 25-50). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the monitoring-controlled amplifiers taught by Fukushima et al. with the optical switch of the combination of Fukushima et al. and Eggleton et al., in order to provide the benefit of amplifying some switched signals before they are output from the optical switch in response to monitoring information for the signals, as taught by Fukushima et al.

Regarding claim 16, the combination of Fukushima et al. and Eggleton et al. disclose that the means for monitoring include means for detecting and isolating photonic node specific faults and mis-connects, and means for triggering protection switching to redundant modules when appropriate (Fukushima et al.: col. 7, lines 4-41; and col. 13, line 51 to col. 14, line 10).

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Regarding claim 17, the combination of Fukushima et al. and Eggleton et al. disclose that the means for monitoring includes photonic node output channel power level compensation responsive thereto (Fukushima et al.: fig. 4 and col. 7, lines 4-41; col. 1, line 64 to col. 2, line 12; and col. 2, lines 29-39).

6. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima et al. (US Patent No. 6362905) in view of Eggleton et al. (US Patent No. 6370300), as applied to claims 13, 16 and 17 above, and further in view of Tsushima et al. (US Patent No. 6424445).

Regarding claim 14 and 15, the combination of Fukushima et al. and Eggleton et al. discloses monitoring in the optical cross-connect used to control protection switching (Fukushima et al.: col. 7, lines 4-41; and col. 13, line 51 to col. 14, line 10), but do not disclose a supervisory channel used for communicating between nodes and for controlling the optical cross-connects. Tsushima et al. disclose an optical node where a supervisory channel is used for communicating between nodes and for controlling the optical cross-connects (Tsushima et al.: abstract and col. 1, lines 14-35). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a supervisory channel, as disclosed by Tsushima et al., between multiple nodes of the combination of Fukushima et al. and Eggleton et al. to communicate monitoring and control information between nodes for network wide performance and fault management, and the triggering of network wide protection and restoration.

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima et al. (US Patent No. 6362905) in view of Eggleton et al. (US Patent No. 6370300), as applied to claims 13, 16 and 17 above, and further in view of Patterson et al. (US Patent No. 6356684).

Regarding claim 18, the combination of Fukushima et al. and Eggleton et al. do not disclose that the means for monitoring includes photonic node output channel dispersion compensation responsive thereto. Patterson et al. disclose individual channel, dynamically adjustable, dispersion compensators that are controlled based on a tapped channel power feedback signal (figs. 13 and 16 and col. 9, lines 48-65, col. 10, lines 5-21 and col. 11, lines 14-23). It would have been obvious to one of ordinary skill in the art at the time of the invention to add individual channel variable compensators to each channel of Fukushima et al., in order to provide the benefit of compensating for any individual channels dispersion that may need compensation based on performance monitoring information for each channel.

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima et al. (US Patent No. 6362905) in view of Eggleton et al. (US Patent No. 6370300), as applied to claims 13, 16 and 17 above, and further in view of Chaudhuri et al. (US Patent No. 6587235).

Regarding claim 19, the combination of Fukushima et al. and Eggleton et al. discloses a node with an optical cross-connect, but do not disclose means for interfacing with electrical signaling network nodes. Chaudhuri et al. disclose a node with an optical cross-connect, including interfaces with electrical signals using electrical-to-optical conversion (fig. 5; col. 5, lines 22-36). It would have been obvious to one skilled in the art at the time of the invention to use electrical-to-optical conversion disclosed by Chaudhuri et al., in the node of the combination of Fukushima et al., Eggleton et al. and Patterson et al., in order to interface with electrical signals in addition to optical signals.

Response to Arguments

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9. Applicant's arguments of 6 June 2005, regarding claims 1, 13 and 20 and their depending claims, have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://paired.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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